

Satyug Darshan Institute of Engineering & Technology, Faridabad

Department of Applied Science and Humanities

Academic year 2025-26

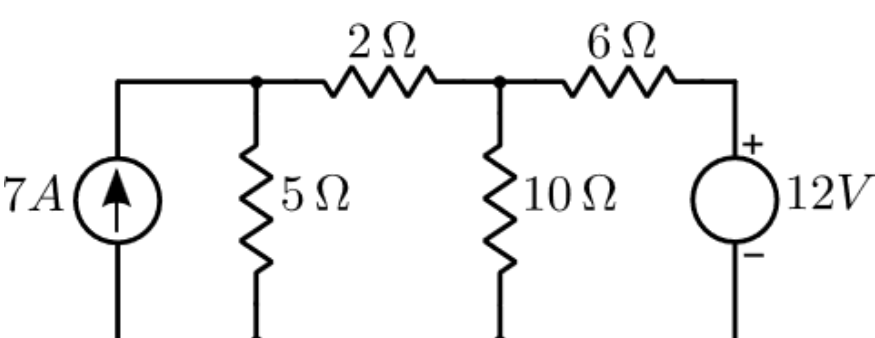
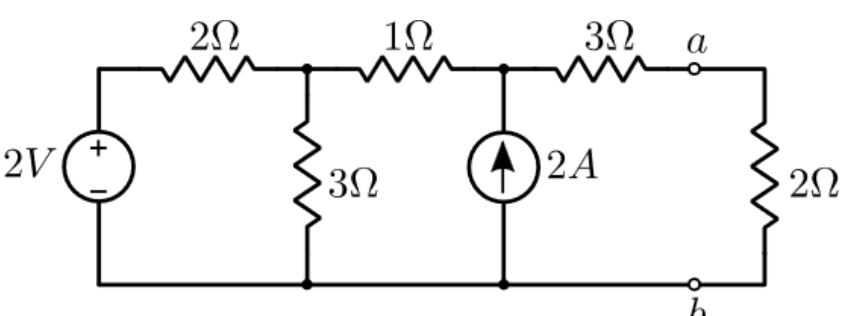
Programme: B.Tech. CE/CSE	Year & Semester: 1st / 1st
Course Name: Basic Electrical Technology	Course Code: ELU-101-V
Prepared by: Mr. Shrish Gupta	

Unit I

Short answer questions

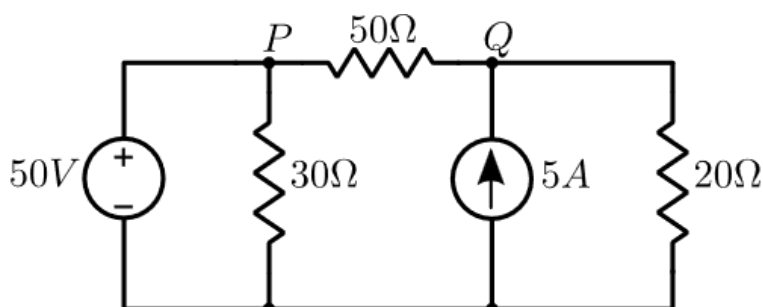
Q.N.	Question	KL
1	Define the terms : node, branch, active element and passive element.	KL1
2	Enumerate various limitations of ohms law.	KL1
3	Convert 4A source with its parallel resistance of 15 ohm into its equivalent voltage source.	KL3
4	Distinguish between active circuit and passive circuit.	KL2
5	Discuss Kirchhoff's Law of voltage and current.	KL2

Long answer questions

Q.N.	Question	KL
1	Write the statement of Norton's theorem and discuss with the help of example.	KL2
2	State the maximum Power transfer theorem. Show that the condition for maximum power transfer $R_L = R_{th}$. Explain its importance.	KL2
3	State and explain Thevenin's theorem by taking example of some suitable DC circuit.	KL2
4	For the circuit given below, find the nodal voltages and the current through $2\ \Omega$ resistance. 	KL3
5	Determine the Norton equivalent circuit of the below network at terminals $a\ b$. 	KL3

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6	Obtain the current in $50\ \Omega$ resistance using Thevenin's theorem in the following given circuit.	KL3
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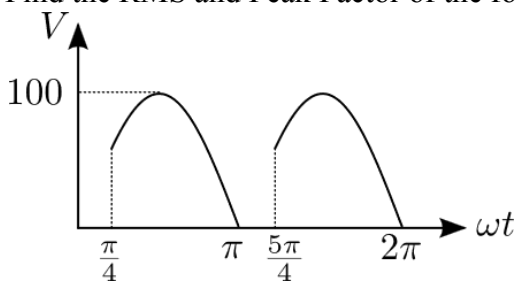


Unit II

Short answer questions

Q.N.	Question	KL
1	An alternating voltage is given by $v = 200 \sin 314 t$. Find its rms value, maximum value and frequency.	KL3
2	Define Q factor & Resonant frequency.	KL1
3	Define reactive power.	KL1
4	Explain why a series resonance is called voltage resonance.	KL2
5	Describe the significance of form factor and peak factor?	KL2

Long answer questions

Q.N.	Question	KL
1	Find the average value, r.m.s. value, form factor and peak factor for full wave rectified alternating current.	KL3
2	Find the RMS and Peak Factor of the following Voltage Function: 	KL3
3	Explain the behaviour of AC in case of pure capacitor also draw voltage current and power waveform	KL2
4	Explain the phenomenon of series Resonance. Also define (i) selectivity (ii) Quality factor.	KL2
5	Define resonance in RLC parallel circuit. Derive the expression for the resonance frequency for the same. also draw a resonance curve.	KL2

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Unit III

Short answer questions

Q.N.	Question	KL
1	Differentiate between star and delta connection in a three phase system.	KL2
2	List the various advantages of a 3-phase system over 1-phase system.	KL1
3	In case of power measurement by two wattmeter method for 3 phase balanced load, under what conditions the one wattmeter will give zero reading and the whole of the power will be measured by the other wattmeter.	KL3
4	Differentiate the unbalanced and balanced load.	KL2
5	Describe the effect on wattmeter readings in two wattmeter method of power measurement for three phase system if the load power factor is unity?	KL3

Long answer questions

Q.N.	Question	KL
1	Derive the Equation for Line and phase voltage in a 3 phase star connected system.	KL2
2	Derive the power equation for a 3 phase delta connected power system.	KL2
3	Explain two wattmeter method to measure power in three phase balanced load and obtain a relation for power factor.	KL2
4	A three-phase load consisting of a resistance of $50\ \Omega$, inductance of $0.3\ \text{H}$ and capacitance of $100\ \mu\text{F}$ is connected to $400\ \text{V}$ $50\ \text{Hz}$. Calculate line current, power factor, total active power (i) when connected in star (i) when connected in delta.	KL3
5	Two "wattmeters" are connected to measure the total power in a three-phase balanced circuit indicating $2000\ \text{W}$ and $500\ \text{W}$ respectively. Find the power factor of the circuit, (i) When both the readings are positive. (ii) When the latter is obtained after reversing the connections to the current coil of one instrument.	KL3

Unit IV

Short answer questions

Q.N.	Question	KL
1	Define the voltage regulation of a transformer	KL1
2	List various applications of auto transformer.	KL1
3	Explain the outcome when a DC supply is connected to a transformer.	KL3
4	Explain statically induced EMF.	KL2
5	Explain the purpose of using laminated core in a transformer.	KL2

Long answer questions

Q.N.	Question	KL
1	With the help of a phasor diagram, explain the working of the transformer at No-load condition.	KL2

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2	Explain the working principle of the auto transformer.	KL2
3	100 kVA, 1200/400 50 Hz single phase transformer has 80 turns on the secondary side. Calculate (i) the approximate value of primary and secondary currents (ii) approximate number of primary turns and (iii) the maximum value of flux in the core.	KL3
4	Derive an expression for saving in conductor material in an autotransformer over two winding transformer of equal rating. State the advantages and disadvantages of an Autotransformer over two winding transformer.	KL3
5	Explain the hysteresis and eddy Current loss. How are they minimised	KL2

Unit V

Short answer questions

Q.N.	Question	KL
1	Write the principle of operation of DC generator.	KL1
2	How is back EMF generated in a DC motor? Explain the significance of back EMF.	KL2
3	Draw the slip torque characteristics of three phase induction motor.	KL1
4	How do you make Single-Phase Induction Motor Self-Starting?	KL2
5	Explain the function of damper winding in the three phase synchronous motor?	KL2

Long answer questions

Q.N.	Question	KL
1	Explain different types of rotor. in a 3 phase Induction motor.	KL2
2	Using double revolving field theory , explain the principle of operation of a single-phase induction motor.	KL3
3	Explain the constructional details and operating principle of DC motor.	KL2
4	Explain with a suitable diagram, why synchronous motor is not self-starting.	KL2
5	Explain principle of operation, constructional features and applications of synchronous generator.	KL2

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Unit VI

Short answer questions

Q.N.	Question	KL
1	Explain the difference between MCB and fuse.	KL3
2	Explain the need of providing the Earthing in electrical system.	KL3
3	Describe the function of using ELCB.	KL2
4	Name one method of power factor improvement.	KL1
5	Describe MCCB	

Long answer questions

Q.N.	Question	KL
1	Define the term power factor and discuss the ways of power factor improvement. Write the various benefits of power Factor improvement.	KL2
2	Write a short note on Earthing and its type.	KL2
3	Explain the function and working of MCB with a diagram.	KL3
4	Describe with suitable diagram the construction and working of earth leakage circuit breaker.	KL2
5	Explain the operating mechanism of MCCB with help of a diagram.	KL3